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ON HERNIA,

WITH

AN ANALYSIS OF 126 FATAL CASES.

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By THOMAS BRYANT.

WHAT form of hernia is most common? What form most equently requires operation? And which is most fatal? are estions which constantly arise in the minds of all surgical udents.

To aid in the solution of these questions, the following ges have been written, and towards the execution of the last, 26 fatal cases have been collected from the records of Guy's ospital, the reports of which are good and authentic. In 88 these, the particulars of the post-mortem examinations are eserved; and from these alone have been drawn up the bles and inferences as to the causes which have produced a tal termination.

A. As regards the first question, *What form of hernia is most mmon?* the statistics of the London Truss Society, ending ith the year 1855, most satisfactorily determine; for, out of 4,478 cases of inguinal and femoral hernia, 75,054 belonged the former, and 9424 to the latter division: or, as it is ore clearly stated in per centages, out of every hundred ses, 88·8 per cent. were inguinal, and 11·1 femoral; inguinal rnia being most frequent by 77·7 per cent. (*Vide* Appendix.)

B. Towards the solution of the query, *What form of hernia ost frequently requires operation?* 281 cases have been llected; of these 105 were inguinal, and 176 femoral: or, in every hundred cases, 37·4 were of the former kind, and 62·6 of the latter. Femoral hernia, therefore, required operation 25·2 per cent. more frequently than inguinal.

c. With respect to the third question, *What form is most fatal?* two tables have been framed—one of successful cases, and one of fatal.

In 169 *cures* after operation, inguinal bore the proportion to femoral as 36·1 per cent. to 63·8, the difference being 27·7 per cent. *in favour* of femoral hernia.

In 117 *deaths*, inguinal bore the proportion to femoral as 44·4 per cent. to 55·5, only 11·1 per cent. being the difference *against* femoral hernia. But as the difference in recoveries was 27·7 per cent., it is clear that inguinal hernia is more fatal than femoral by 16·6 per cent.

d. We now come to the analysis of the 126 fatal cases of hernia; and, bearing in mind the fact that tables are only valuable in so far as, by their analysis, they enable us to establish, or bring out, certain conclusions, it has been thought undesirable to occupy valuable space by their publication as a whole. The materials, however, upon which the various conclusions are founded, have been compiled into many short tables, enabling others thus to examine the grounds upon which these conclusions are based. These tables having been framed with great care, and each conclusion carefully weighed before written, it is hoped that the truth of each will be acknowledged, and the omission of the table, as a whole, not considered unwise.

Table I.

Short Analysis of the 126 *Fatal Cases.*

		Males.	Females.	Sac.		Side.	
				Opened.	Not.	Right.	Left.
126	65 Femoral . . .	13	52	32	19	34	14
	52 Inguinal . . .	52	—	30	4	16	17
	8 Umbilical . . .	6	2	3	1	—	—
	1 Obturator . . .	—	1	—	1	1	—

E. *The ages at which the different forms of hernia first make their appearance.*—From the following table, it will be observed, omitting the congenital form, that, in inguinal hernia, from 20 to 40 years of age is the period when the rupture most frequently commences; but in femoral at these ages it is comparatively rare, as, in the majority of cases, it appears between 50 and 70 years of age.

TABLE II.

	Inguinal.	Femoral.		Total.
	Males.	Females	Males.	
Congenital	7	—	—	7
Age of 10 years and under	2	—	—	2
,, 20 ,, ,,	4	1	—	5
,, 30 ,, ,,	8	4	—	12
,, 40 ,, ,,	5	8	1	14
,, 50 ,, ,,	1	7	1	9
,, 60 ,, ,,	2	11	6	19
,, 70 ,, ,,	1	9	2	12
,, 80 ,, ,,	—	3	—	3

F. *Duration of the hernia before strangulation.*—In 28 cases, it was recent, and strangulated on its first descent. In 98 cases, it had existed years. Recent cases bearing the proportion to old as 22 per cent. to 77. Of the 28 recent cases, 21 were femoral and 7 inguinal; and of the 21 femoral, 17 were about 60 years of age. From this it is evident that femoral hernia is more frequently strangulated upon its first descent than inguinal.

Seven of the 98 cases were congenital. Fourteen had existed *many* years, the exact number not being stated.

Of the 76 remaining—

TABLE III.

	Inguinal.	Femoral.		
	Males.	Females.	Males.	
10	2	7	1	had existed 5 years or less.
11	2	5	4	,, 10 ,,
17	8	6	3	,, 20 ,,
5	3	1	1	,, 30 ,,
3	3	—	—	,, 40 ,,

The average duration of femoral previous to strangulation being 11 years; of inguinal, 20 years.[1]

G. *Ages when the hernia became strangulated.*—The succeeding table by its evidence well supports the conclusions drawn from Tables II and III. In the former, it was shown that inguinal hernia most frequently made its first appearance between the ages of 20 and 40; and femoral, between the ages of 50 and 70. In the latter, that the average duration of inguinal hernia prior to its strangulation was 20 years; of femoral, 11. From this it would be expected, that the favorite ages for inguinal would be between 40 and 60; and for femoral, between 60 and 80. And this the table fairly proves, remembering at the same time the fact, that femoral hernia is most liable to strangulation on its first descent; and that of the 28 recent cases, 21 were femoral, and that the subjects of it were about 60 years of age.

TABLE IV.

	Inguinal.	Femoral.		Total.
	Males.	Females.	Males.	
Age of 20 and below	1	1	—	2
„ 30 „	14	3	—	17
„ 40 „	9	7	—	16
„ 50 „	11	12	—	23
„ 60 „	10	13	5	28
„ 70 „	7	11	4	22
„ 80 „	—	5	3	8
„ 90 „	—	—	1	1

The average age of persons suffering from strangulated inguinal hernia being 43; from femoral, 55.

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[1] An interesting paper by Mr. King, upon this subject, may be here referred to, published in the third volume of the first series of the 'Guy's Hospital Reports.'

H. *The period of strangulation* is the next point in the series of events, and this also is compressed into a table.

TABLE V.

20 cases were strangulated 24 hours, or less.
26 ,, ,, 48 ,,
15 ,, ,, about 3 days.
12 ,, ,, ,, 4 ,,
6 ,, ,, ,, 5 ,,
9 ,, ,, above 5 ,,

The minimum period of strangulation being 8 hours; the maximum, 14 days. The average period of strangulation for femoral hernia being 76 hours and a half; for inguinal, 50 hours and a half.

I. *Duration of life after operation.*—From the following table, it will be seen that more than half the cases died within 48 hours; the second day proving the most fatal; and that four fifths died within the first week. The most rapid death after operation being five hours, the operation having been performed merely as a *dernier ressort*.

TABLE VI.

Cases.	Inguinal.	Femoral.		
	Males.	Females.	Males.	
21	13	8	—	died within 24 hours.
35	15	17	3	,, 48 ,,
10	3	7	—	,, 3 days.
11	4	4	3	,, 4 ,,
5	3	1	1	,, 5 ,,
3	2	—	1	,, 6 ,,
2	1	—	1	,, 7 ,,
12	5	5	2	,, 14 ,,
6	—	5	1	,, 21 ,,
4	1	3	—	,, 28 ,,

K. *Causes of death.*—The annexed table has been framed to show briefly the causes of death.

Table VII.

5	cases	died	without operation.
14	,,	,,	after the application of the taxis.
27	,,	never	rallied after the operation.
12	,,	sank	from diarrhœa, or collapse after a copious stool.
16	,,	,,	with artificial anus.
4	,,	,,	with internal strangulation.
2	,,	,,	after reduction of hernia *en masse.*
12	,,	,,	with fæcal extravasation.
26	,,	,,	with general peritonitis and inflamed bowel.
1	,,	,,	with internal hemorrhage.
2	,,	,,	from sudden collapse.
5	,,	,,	from bronchitis, pneumonia, or erysipelas.

L. *Cases which died without operation.*—Of these 5, 2 were femoral, 2 inguinal, and 1 umbilical.

Case i.—With the umbilical there was no history, except that the hernia had not been strangulated for more than twenty-four hours before death, but had existed for ten years. Gangrenous and firmly constricted omentum, and small intestine, formed the contents of the sac. No lesion, or appearance of disease, was found in any other portion of the body. The shock to the system had evidently been the cause of death.

Case ii.—Inguinal hernia, in a man, æt. 25; was similar to the last as to the cause of death, was without a history, and had been undiscovered. The testicle, descended only to the external ring, obscured a small congenital bubonocele, consisting of omentum and ileum; these were congested and inflamed; the bowel above the strangulated portion was remarkably distended, and measured ten inches in circumference. The other viscera were healthy.

Case iii.—A scrotal hernia, in a man, æt. 34; who died on th fifth day after its strangulation. Acute peritonitis of the uppe bowel, without effusion, existed, and a gangrenous sac containing fæces with gangrenous ileum and omentum. N internal extravasation was present, but, on applying tractio to the strangulated bowel, fæces flowed from the lacerating line of stricture.

Case iv.—Femoral, in a woman, æt. 52; who died exhausted on the eleventh day, without the slightest evacuation from the bowels. The sac burst in separating the inflamed and nearly perforated skin, exposing an opening in the lower ileum, firmly adherent by its margin to the mouth of the sac; flakes of lymph were scattered over the peritoneum, but no fæcal extravasation.

Case v.—Also femoral, in a man, æt. 70; who sank exhausted from sloughing of the groin and copious intestinal discharges from the wound and anus, on the eighteenth day after strangulation. On the eleventh the sac had evidently given way, and on the twelfth an incision into the tumour was sanctioned by the patient; fæces had passed *per rectum* for several days. The sac contained omentum, and patulous ileum, a portion only of its circumference having evidently been strangulated. The peritoneum was congested, but uninflamed.

m. *Fatal cases following reduction by the taxis.*—Of the 14 cases, 8 were inguinal and 6 femoral, 2 of the latter being males.

In 5 of these, 1 only being inguinal, the bowel was ruptured. In 2 (inguinal) the hernia was reduced *en masse.* In 2 (inguinal) strangulation still existed in the sac. In 1 (inguinal) internal strangulation existed. One died from diarrhœa on the second day, and one with peritonitis; both were femoral, and in both gangrenous intestine was found.

In 2 cases, the peritoneal coat alone was ruptured. One, femoral, was admitted moribund, and lived only a few hours after its reduction; the second, inguinal, survived two days, sinking with peritonitis.

n. *Ruptured bowel.*—In 2 of the 5 cases, extravasation followed, and speedy death. In 2 a flake of lymph prevented extravasation. In 1 (inguinal) the intestine was glued to the peritoneum, the man being much intoxicated; after its reduction he walked to his bed, speedily collapsed, and died.

(Chloroform was not used.) In 3 of these cases death followed in a few hours; in 2 from extravasation, and in 1 from collapse after a copious motion. In 1 case, although the patient rallied after the taxis, she gradually sank on the fourteenth day; no peritonitis was present, the only abnormal condition being a portion of ileum, which had been ruptured, and its edges inverted and glued together.

O. *Cases which refused to rally after the operation.*—Amongst these 27 cases, 6 were inguinal, 19 femoral, and 2 umbilical.

12 died within the first 24 hours.
12 ,, ,, second ,,
3 ,, ,, third ,,

The average period of strangulation in these cases was fifty-two hours in the inguinal, and seventy-six in the femoral.

P. *Cases of death from diarrhœa, or collapse after a copious stool.*—Twelve cases are tabulated under this heading. Six were inguinal, and 6 femoral. Eight sank within twenty-four hours after its first appearance, and 6 of these rapidly after the *first* discharge. Four only survived, three, four, and five days respectively. In 4 the diarrhœa appeared within twenty-four hours after the operation; in 2 within two days; in 1 within three; 1 within four; and in 4 upon the fifth day. From this it is clear that collapse and death after a copious motion is by no means a rare occurrence.

Q. *Artificial anus.*—Included in the 17 cases of artificial anus, were 13 femoral, 3 inguinal, and 1 umbilical.

In 8 of these the intestine was slit open at the time of operation: in 1 the gangrenous bowel was left in the sac; in 6 the bowel was returned into the abdomen, and subsequently sloughed.

In 2 (inguinal) no operation had been performed.

Three of the 8 cases where the bowel was slit open by the surgeon, lived two days; 2 three days; 3 twelve, fifteen, and twenty-five days, respectively; the last case went on well till the day of his death, when, on making some slight effort, he fainted and died.

In the case of gangrenous bowel which was left in the sac the intestine gave way on the third day, profuse fæcal discharge followed, succeeded by collapse and death.

In 1 of the 6 cases where the gangrenous bowel had been returned into the abdomen, the sac was not opened at the time of operation; the patient was an old woman, æt. 72, collapsed at the time of operation; on the ninth day, the sac and intestine sloughed, and, upon the nineteenth, she sank exhausted. In 4 others, the fæcal discharge first appeared upon the fourth, sixth, ninth, and tenth days, respectively; in all, death followed upon the ninth or tenth day, from exhaustion. In 1, acute peritonitis occurred after some weeks' favorable progress, from fæcal extravasation.

From the above, we may fairly conclude that artificial anus much more frequently follows femoral than inguinal hernia. That the cause of death, in such cases, is generally exhaustion; and, that it occurs more rapidly when the intestine is slit open at the time of operation than when it naturally follows its return into the abdomen.

B. *Cases of internal strangulation.*—Of the 6 cases of hernia associated with internal strangulation, 4 were inguinal, 1 femoral, and 1 umbilical.

In 1, inguinal, the portion of ileum below the hernial protrusion was twisted upon itself: herniotomy had been performed. In 1, a band of membrane, passing from the mesentery to the omentum, was the cause of the strangulation: in this case the hernia had been reduced by the taxis. In 1 case of femoral, the cæcal appendage formed the constricting band. In the remaining 3 cases the hernia had been reduced *en masse:* in 2, inguinal, the tumour had existed for upwards of thirty years, in patients above 60, and 1 had been irreducible: one of these lived three days, the other eight, after its strangulation, and two and three after its reduction by the taxis; in both, peritonitis was the cause of death, associated in one with gangrenous bowel; in the other the gut was only incarcerated. The third case was umbilical, in a man aged 86. After four days' strangulation, herniotomy was performed, and the contents of the opened true sac reduced. On the third day after the operation death ensued, when recent peritonitis was found, with a small omental sac, strangulating a piece of small intestine, the line of stricture only, being of an ash colour, and easily torn.

s. *Death from internal hemorrhage.*—This case occurred in a man, æt. 26, with inguinal entero-epiplocele; the omentum was incised, and intestine returned. On the second day the man died, when about a pint and a half of fluid blood was found in the peritoneal cavity; the epigastric artery was not wounded, the bleeding having evidently proceeded from the incised and reduced omentum.

t. *Cases of death from sudden collapse.*—Two cases are stated to have suddenly collapsed and died.

One, a man, æt. 73, with femoral hernia of twenty-two years' duration, was operated upon, and progressed favorably till the ninth day, when he suddenly collapsed, and died in a few hours. A low form of peritonitis was found on examination, and the sac inverted into the abdomen; to this was attached a dark knuckle of ileum, and at the point of junction the intestine was ash-coloured.

The second case, a man, æt. 39, after herniotomy for inguinal hernia, progressed well for ten days, and then suddenly sank. On necroscopic examination, a local peritonitis was found to exist at the mouth of the sac, glueing the reduced, congested, but elastic ileum, and inclosing a little puriform deposit; the mucous lining of the bowel was much congested, and covered with lymph. Viscera otherwise healthy.

u. *Contents of the sac.*—Of the 88 cases where the body was examined after death—

TABLE VIII.

In 57 the sac contained ileum.
2 ,, ,, ,, with colon.
1 ,, ,, ,, with cæcum.
6 ,, ,, jejunum.
22 ,, ,, small intestine, which portion not mentioned.
33 cases the omentum was included.

In 4 of the 57 cases where ileum was the portion of bowel strangulated it was the *upper* portion, in 3 the *middle,* and 21 a portion of the last two feet.

v. *Position of the contents, with respect to the neck of the sac.*—In 9 cases they were adherent to the cavity of the sac; in 40 cases they were adherent, or situated at the sac's mouth; in 2 only they were stated to be distinct from the sac, and in these it may be questioned whether the manipulations in the examination were not the cause of their altered position.

w. *Condition of the hernia contents.*

Table IX.

In 31 cases the bowel was in various stages of congestion and inflammation, but *elastic*.
14 ,, ,, ,, covered with lymph.
7 ,, ,, ,, thickened.
15 ,, ,, ,, gangrenous.
14 ,, ,, ,, sulcated at the line of stricture.
17 ,, artificial anus existed.
14 ,, the bowel was perforated.
2 ,, the peritoneal coat was alone ruptured.
6 ,, fæcal extravasation existed.

x. *Condition of the peritoneum.*

Table X.

In 10 cases it was declared to be healthy.
10 ,, ,, simply injected.
10 ,, ,, found greasy.
37 ,, lymph was effused, more or less generally.
5 ,, ,, ,, ,, locally.
10 ,, bloody serum was effused.
4 ,, fæcal extravasation had taken place.
2 ,, fetid serum existed.

From the four preceding paragraphs, it is fair to conclude, that—

The ileum is by far the most frequent portion of the intestine strangulated, and that in the majority of cases it is part of the last two feet.

That the returned bowel, as a rule, remains at the neck of the sac, and that it is generally fixed there by adhesions.

That in about 69 per cent. of fatal cases, peritonitis exists sufficient to produce death, that is to say, lymph in some of its forms is generally effused.

Y. *Gangrenous intestine, &c.*—Eleven of the 15 cases, tabulated in Table IX, were femoral, and 4 inguinal.

In 3 of the latter the hernia had been reduced by the taxis, and in 1 no operation had been performed. In *all* these cases the gangrenous bowel was situated at the mouth of the sac.

In Paragraph Q it may be seen that there were 7 cases in which the bowel had been returned after operation, and in which artificial anus subsequently appeared. All of these cases were also femoral.

Of the 8 cases also of artificial anus made at the operation, 6 were femoral, 1 inguinal, and 1 umbilical. Omitting this latter, there are 29 cases of gangrenous bowel, 25 of which were femoral, and 4 inguinal; the cause of gangrene in these cases of inguinal having been evidently forcible taxis. From this it is clearly proved that femoral hernia is much more frequently associated with gangrenous bowel than inguinal.

Z. *Bowel sulcated at the line of stricture.*—Under this head are 14 cases; 7 of these were femoral, and 7 inguinal. In 4 only, and these were inguinal, did ulceration occur at this line; in 3 general extravasation followed, and in 1 this was local.

ZA. *Perforated bowel.*—Of the 15 cases, 10 were femoral, and 5 inguinal. In 4 cases the perforation occurred at the line of stricture; in 11 at about the *centre* of the knuckle. Of the 4 cases where it occurred at the line of stricture *all* were inguinal; in all ulceration was the cause; in 3 general extravasation followed, in 1 local. In 5 of the 11 cases where perforation took place about the centre of the knuckle, the taxis had been the cause of the rupture, and in 2 of these general extravasation followed. Four of the 5 cases were femoral, and 1 inguinal; in 3 (femoral) gangrene was the cause, and in 1 local extravasation followed. In 3 (femoral) the perforation was produced by ulceration. In the remaining 8 cases extravasation was prevented by the exudation of lymph; in 4 a flake closed the aperture; in 2 the intestine was adherent to the peritoneum; in 1 case the bowel, perforated to the size of a pinhole, was left in the sac; and in 1 the edges of the rupture were inverted and glued together.

ZB. *Fæcal extravasation.*—Three of the 7 cases in which fæcal extravasation occurred were femoral, and 4 inguinal; in 5 it was general, and 2 local. In 2 cases the taxis had been the cause; in 4 cases ulceration; and in 1 gangrene. The 4 cases in which ulceration had been the cause were all inguinal, and in all the upper line of stricture was the seat of the perforation.

Conclusions.—1. That *inguinal* hernia is more common than femoral by 77·7 per cent.

2. That *inguinal* hernia most frequently commences between 20 and 40 years of age, and *femoral* between 50 and 70.

3. That the average duration of inguinal hernia prior to its strangulation is 20 years, of femoral 11.

4. That inguinal hernia most frequently becomes strangulated before 50 years of age, and femoral after this time.

5. That the average age of persons with strangulated inguinal hernia is 43, of femoral 55.

6. That femoral hernia requires operation 25·2 per cent. more frequently than inguinal, success in its reduction by the taxis being less frequent.

7. That, after operation, inguinal hernia is more fatal than femoral by 16·6 per cent.

8. That 22 per cent. of cases requiring operation are recent, and are strangulated on the first descent.

9. That three fourths of these recent cases are *femoral.*

10. That the average period of strangulation in fatal cases of inguinal hernia is 50½ hours, of femoral 76½.

11. That half the fatal cases of hernia die within 48 hours after the operation, and four fifths within the first week.

12. That three fourths of the cases which refuse to rally after operation are *femoral.*

13. That collapse and death after a copious motion is by no means a rare occurrence.

14. That artificial anus much more frequently follows *femoral* than inguinal hernia.

15. That the cause of death in cases of artificial anus is generally exhaustion; that death occurs more rapidly when the intestine is slit open at the time of operation, than when the opening in the bowel naturally follows its return into the abdomen.

16. That sudden collapse and death occasionally occur in cases of hernia which have progressed favorably for many days, without any *local* cause.

17. That in about 69 per cent. of fatal cases, peritonitis exists sufficient to produce death; that is to say, lymph in some of its forms is generally effused.

18. That in nine tenths of the cases of hernia, the *ileum* is the portion of bowel strangulated; and in three fourths of these it is part of the last two feet.

19. That as a rule, the strangulated bowel, when returned, rests or is fixed by adhesions at the mouth of the sac.

20. That in *all* cases of gangrenous bowel the affected portion will be found at, if not adherent to, the mouth of the sac.

21. That femoral hernia is much more frequently associated with gangrenous bowel than inguinal.

22. That ulceration at the line of stricture is more frequent in inguinal hernia; although the sulcated condition of the bowel is as common in femoral as in inguinal.

23. That fæcal extravasation, if not produced by ruptured bowel from the taxis, generally follows ulceration at the line of stricture, and is consequently generally found in inguinal hernia.

24. That ruptured bowel from the taxis is most frequent in femoral hernia.

25. That fæcal extravasation does not necessarily follow rupture of intestine by the taxis.

26. That fæcal extravasation does not occur so often as 50 per cent. in cases of rupture or perforation of the bowel.

From the above conclusions it is clear that—

Inguinal hernia is more common than femoral; commences earlier in life; is less liable to strangulation on its first descent, and generally exists twenty years before it becomes so; requires operation less frequently, but is more fatal; is less frequently associated with gangrenous bowel, but more frequently with ulceration at the line of stricture.

Femoral hernia is less common than inguinal; seldom appears before 50 years of age; is more frequently strangulated on its first descent, but generally averages eleven years' existence; more frequently requires operation, but is less fatal; and is generally strangulated for a longer period before relieved. After operation, femoral hernia is more frequently followed by sinking than inguinal; is more frequently succeeded by gangrenous bowel and artificial anus; but is less frequently associated with ulceration at the line of stricture and fæcal extravasation, unless this occur from rupture by the taxis, to which it is *more* liable.

PRACTICAL DEDUCTIONS.

The preceding conclusions, brought out as they have been by a careful analysis of the materials collected—and each of which, it is believed, will be acquiesced in as facts by all who take the trouble carefully to peruse these pages—must necessarily yield (what all researches should invariably tend to) some practical points, either to guide us in the future practice of our profession, or to warn us from dangers, palpable or obscure.

1. The first point that may be dwelt upon, and which appears as clear as it is important, is the necessity of operating earlier in femoral than in inguinal hernia. The danger of delay in all cases, where strangulation is evident, is now so well appreciated by surgeons generally, that there is no necessity to stimulate such a feeling; but, unfortunately, there is need to urge them to act upon the knowledge of it; for the fact that so many cases are admitted into Guy's Hospital, in a dying and almost hopeless condition, proves too truly that such is not sufficiently understood, or at any rate is not practically carried out. But in femoral hernia delay is of peculiar importance, for three fourths of the cases which refuse to rally after operation are of this kind. This fact alone is sufficient

to indicate, that in femoral hernia, the ultimate result of all strangulation, namely, death of the part, occurs more rapidly than in inguinal. But when with this it is considered that this form is generally found in old women, who are, of course, less able to resist any such injury; that gangrenous bowel and artificial anus are much the most frequently associated with it, the truth (for such it must be called) that femoral hernia passes into a state of gangrene more rapidly than inguinal, becomes evident; and, as a result, the practical conclusion remains to be drawn, that in femoral hernia early relief is most imperative. And here the form in which it is to be applied must not be passed over; for recognising the conclusion that ruptured bowel from the taxis is most frequent in femoral hernia, together with the fact just mentioned, that gangrene is most frequently associated with it, the inference that the taxis should be employed sparingly and carefully cannot but be drawn. Our rule, then, in such cases, should be, to operate early; to let nothing like force be employed in the attempt at reduction, and not to let valuable time be lost by baths and other fancy remedies. To support also such an opinion, another argument may be employed, deduced from the conclusions numbered 1 and 6. It will be there seen that femoral hernia is less common than inguinal by 77·7 per cent., and yet requires operation 25 per cent. more frequently; leading us most fairly to infer that, when down, the taxis seldom succeeds in its reduction; and coupling this with the preceding remark, the practical conclusion just drawn becomes more apparent in its truth. The anatomical reasons for this, it might not, perhaps, be difficult to explain; but, as it is only intended to make remarks upon points which the materials collected seem to warrant, it will suffice to say that the smallness and unyielding nature of the crural ring, together with the sharpness of Gimbernat's ligament, seem sufficient for its explanation.

2. With these anatomical conditions are closely connected in interest another point, which certainly at first sight appears strange. In the twenty-second conclusion of the table, it is stated that ulceration at the line of stricture is more frequent in inguinal, although the sulcated condition of the bowel at the line of stricture is as common in femoral hernia. The

materials for drawing such an inference (Parag. Z and ZB) could warrant no other conclusion, and it can hardly be stated to be a chance that the cases collected should indicate such a result; for although the numbers of each species in which sulcated bowel was detected were equal, in no one case of femoral did ulceration exist; in several commencing gangrene coexisted, and in one rupture from the taxis, but not in the line of stricture. That such ulceration does occur it is not to be denied; but, as a rule, the tightness of the stricture seems so intense that death of the part is the general result; the more general and less rapid constriction of inguinal hernia, being, apparently, required to produce ulceration. That such an opinion is reasonable, analogy well bears out; for in surgery the application of a ligature to an artery, a nævus, or a polypus, if well and firmly applied, is first followed by sphacelus of the distal growth, and subsequently by ulceration, but if timidly applied, and without producing a total arrest of the circulation, ulceration will be the first if not the only consequence.

In the bowel, then, why should a different termination be expected? The general smallness of strangulated femoral hernia, and the anatomical peculiarity of the ring, acting and reacting upon one another, are rapidly followed by gangrene (unless relieved), and then ulceration. But in inguinal hernia the larger and more dilating neck, the greater mass of bowel which generally exists, affording, by its size, as it were, a cushion for the resistance of the former, is as a rule more frequently succeeded by ulceration.

3. That collapse and death after a copious motion is by no means a rare occurrence, is a conclusion perhaps recognised by all; but there is a point connected with it which may be considered worthy of a few remarks, and also of some practical importance.

The administration of purgatives after herniotomy is now, happily, obsolete; but the anxiety of the surgeon to witness a return of the action of the bowel, has not, perhaps, so subsided, as to prevent a frequent, and may be too frequent, use of the enema: that such is the case, occasionally, is not to be doubted, for the too frequent remarks in notes of reported eases, such as "collapse and death after a copious stool following an enema," forbid any other conclusion. The subsequent treatment to herniotomy by opium is chiefly vaunted (and with perfect justice) for its value in preserving rest to the returned bowel, and thus allowing it time to regain its tone before being called upon to perform its natural duties. And here the question presents itself—Why urge it then at all? The lower bowel, on the first appearance of strangulation, is not unfrequently emptied of its contents, and seldom is it found after death at all distended with fæces; not so the upper portion. As a rule this will be seen full of liquid excretion, ready as it were to "flush" the lower intestine the moment the returned bowel has sufficiently recovered to permit its passage. Why, then, administer enemas? for although their action is not to be compared to the mischief produced by purgatives, still they do stimulate the intestinal canal, and unquestionably at times hasten, if not cause, death. That they are of value, and necessary in some cases, cannot be questioned: still as a rule, perhaps, they should not be administered, and certainly not merely to hasten the action of the bowel, unless decided symptoms are present which denote its over-distension.

4. In conclusions 19 and 20 it will be seen that, as a rule, the strangulated bowel, when returned, rests, or is fixed by adhesions, at the mouth of the sac; and that in all cases of gangrenous bowel, the affected portion will be found at, if not adherent to its mouth. If this latter is a rule, as it doubtless is, with only such rare exceptions as every rule possesses, the practice of stitching the edges of a bowel, when found in a gangrenous condition and opened, to say the least of it, is unnecessary. The object of such a practice, viz., to prevent the retraction of the divided portion from repassing into the abdominal cavity, and thus producing fæcal extravasation and its attendant consequences, being happily prevented. The inflammatory action which always attends strangulation of the bowel, and more especially at the sac's neck, carefully provides for this contingency, which it foresees; rendering not only fæcal extravasation from gangrene, in these cases, exceptional, if not unknown, but the practice of mechanically fixing the edges of the divided bowel unnecessary, and even wrong. For

the primary object for which such practice is generally adopted, having been shown to be needless, nature's processes having forestalled man's inventions, it remains for us only to reflect that in the second stage of artificial anus, that is, when the fears of extravasation, &c., have passed away, and the fact that the divided bowel and the sac's neck are firmly glued together is established, that this very retraction is the process by which any cure can be expected; for by it the ends of the divided bowel, with the retracting neck of the sac to which they are adherent, forms that temporary channel through which the intestinal fluids find their way to the lower bowel, and thus allow time for the other operations of nature to perfect a cure. Any interference, then, to such a process, cannot but be regarded as improper; and undoubtedly the ligaturing of the bowel's edges to the integuments must come under such a heading. For it is clear, if the necessary amount of retraction in the most favorable cases is but just sufficient to allow a cure, that the required portion of internal retraction must be almost entirely prevented, where the integuments and external coverings form the boundary, and with it the resistance. It is true that these assist well to form a firm and direct channel for the conduction of the fæces externally; but this very truth is an extra argument against the practice; for what hope can be entertained of a cure, when the bowel is, as it were, everted, and the traction has been exerted from without instead of from within. It may be said, however, that the practice forms an increased security, and that the chances of recovery, in artificial anus, being so slight, that it outweighs in the balance any objections against it. But to such reasoning it must be answered, that where security exists, extra security is not wanted; and that the fact that recovery from such cases of artificial anus does take place, should totally prevent the surgeon from pursuing a practice which excludes all hope of such a result, and at the best can only prolong a life which is generally a burden, and undoubtedly a misery to the patient and those around him.

5. With regard to the great question of opening or not opening the sac in hernia, the conclusions have a decided tendency towards the latter operation, although more, perhaps, by negative than positive evidence.

Not entering upon the mere question of per centage recoveries, as compared in the two operations—so many extra circumstances separately influencing the termination of a case, besides the question of opening or not opening the sac,—the present materials will only lead me to examine into the truth of the dangers by which the advocates of the former method believe the more lenient operation to be surrounded. And summed up into two heads, the fear of returning a ruptured or gangrenous intestine into the abdomen, or of a bowel strangulated by the sac's contents, include the principal, if not the only dangers. That such accidents may happen there is no doubt; but whether they are more liable to occur in such cases as may require an operation, than in cases where a line of practice is adopted which all agree upon as being the first means to be employed, namely, the taxis, is not so certain. To return a gangrenous bowel into the abdomen, either by the taxis, without dividing the stricture, or with doing so, is not easy. The accompanying inflammatory action not only always glucing the gangrenous intestine to the sac's mouth, but very frequently to the sac itself; thus rendering the application of the taxis in both its modifications perfectly useless. Here, then, the opening of the sac is called into requisition. But why, as a rule, do more than is required at an operation, because exceptional cases may occur, in which some fancied or real mischief may follow the simpler means? By the same argument, the taxis itself would be abolished, and herniotomy always be employed; for, undoubtedly, the former has produced more mischief, as a whole, than any operation, whether of opening or not opening the sac. But if this fancied mischief can be shown to be groundless, and if it can be shown to be probable that on the gangrenous bowel being returned, little or no evil is likely to result, the argument against such a practice falls to the ground, and, as a sequence, the milder operation is supported. Such a truth the materials of this paper seem to ratify; for in no one case of gangrenous bowel did extravasation occur, and in all, the intestine was glued to the sac's mouth. In many cases the bowel subsequently sloughed, but in all artificial anus followed; and in one instance, which made great impression at the time, the sac was *not* opened, the intestine was returned to its position at the sac's mouth, subsequent sloughing followed, the sac easily gave way, and artificial anus was established; showing, at least, in one case, the leaving of the sac unopened was certainly not disadvantageous. In all the deaths related, not one case is numbered, where the opening or not opening the sac could have been a point of any importance. In the cases of gangrened bowel, it has been shown that no evil was the result of its return; but in conclusion 15 it is rendered probable, that the return of the gangrened bowel into the abdomen, and the leaving to nature the mode of establishing an artificial anus, was of a decidedly beneficial character. For it is certain, that in those cases where such a result followed the surgeon's interference, death followed *more* rapidly than where the process was left to nature. In the former cases, it may be said that such a result would be expected, as they were evidently of a worse character, or else such interference as opening the bowel would not have been deemed necessary. But such a conclusion is hardly just; for, as the danger of a strangulated hernia depends upon the obstruction to the intestine, and as that obstruction exists as surely from a gangrenous bowel within the abdomen as one within a hernial sac, and as relief in both first consists in the establishment of an external outlet till such an end ensues, the mechanical obstruction still exists, and both classes of cases are in an equal position. And as it has been shown that life is longer when nature's processes bring about this result, the advantages of returning a gangrenous bowel to the sac's mouth cannot be denied.

6. What, then, are the conditions of intestine where its return would not be advantageous? is a question which naturally follows; and with all due deference to the opinions of others, and with diffidence in making known my own, the force of evidence compels me to the conclusion, that in only one condition can such practice be deemed advisable, and that is where the bowel is decidedly ruptured. When gangrenous only, the neck of the sac has been shown to be its right position, in any other more favorable condition no one will dispute the practice of reducing it. But when ruptured, I would say leave it in its place, return any unaffected bowel if present, but leave the ruptured portion. And as the "let alone" practice

seems most favorable, even then, perhaps, it may be employed with benefit, and the bowel left for nature to open further. Here, then, research and analytic evidence come forward to support an opinion stated to the author by his late respected teacher, Mr. Aston Key, who startled him with the then strange opinion, "that in all conditions of the intestines the abdomen was their right place." That such a rule is right, excepting in case of rupture or perforation of the intestine, the force of the evidence compels me to admit; and although not expecting others altogether to agree, still, as the object in starting was fairly to express the results which the materials, together with much careful reflection, have enabled me to bring out, I leave them, with all deference, to the kind judgment of those who consider these pages worth perusing.

On another occasion, perhaps, this subject may be pursued further; upon the present, the limit to space forbids its greater extension.

APPENDIX.

Statistics of the London Truss Society, as published in the Year 1855.

Males.	Females.			Total.
16,650	687	Left Inguinal, 17,337	46,551 Inguinal	54,003 Single.
28,471	743	Right „ 29,214		
315	2,667	Left Femoral, 2,982	7,452 Femoral	
498	3,972	Right „ 4,470		
28,137	366	Double Inguinal		30,475 Double
177	1,795	„ Femoral		
741	3,064	Umbilical		4,481
229	447	Ventral		
1	3	Perineal		4
1	4	Obturator		5
461	254	Prolapsus Ani		715
—	2,517	„ Uteri		2,816
—	57	„ Vaginæ		
—	242	„ Vesicæ		
2,713	1,674	have been cured		4,387
78,394	18,492			96,886

Of these 96,886—78,394 were males, and 18,492 were females: 75,054 were cases of inguinal, and 9424 of femoral hernia; or, in per centages, 88·8 per cent. were of the former, and 11·1 of the latter variety.

Sex.—Of the inguinal, 97·6 per cent. were males, and 2·3 females; inguinal hernia being most frequent in males by 95·3 per cent.

Of the femoral, 10·5 per cent. were males, 89·4 females; femoral hernia occurring more frequently in females by 78·9 per cent.

As regards the question of *double hernia,* it will be seen, that of every hundred cases of inguinal, 37·9 per cent. were of this form; and of femoral, 20·9 per cent.

Side of hernia.—It is also shown, that single inguinal hernia occurs 62·75 per cent. on the right side, and 37·24 on the left; inguinal hernia being most frequent on the right side by 25·51 per cent. In single femoral hernia, 59·9 per cent. are on the right, and 40 on the left; the difference being in favour of the right, of 19·9 per cent.